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thermoplastic material containing barium sulphate in amount by weight, expressed as per cent ratio on the total weight of the diffusing layer, in the range 0.01-2%, the barium sulphate having average particle sizes in the range 0.1-50 micron, the composite sides being at least \geq 10 cm, said composite having one or more edge lit, the composite area being greater than 600 cm^2 .

Fig 2 Spec. Surf. Area

REMARKS

Claims 1-16 are pending in the above application. Claims 1-14 and 16 have been rejected. Claim 15 has been objected to and Claim 1 has been amended. Support for the amendment can be found throughout the application, for instance in the claims as originally filed. No new matter is added. Claims 1-16 are submitted for consideration at this time. Applicants respectfully request reconsideration and withdrawal of all rejections.

Claims 1-7, 12 and 16 have been rejected under 35 U.S.C. §103(a) as obvious in light of U.S. Patent No. 5,422,523 (Kashima) and EP 0742181. Each reference will be addressed in turn below.

Applicant takes this opportunity to revisit some of the benefits of the present invention. It has been discovered that a thermoplastic composite that consists essentially of a base thermoplastic layer and a diffusing layer that is placed on one or both of the sides of the base layer, the diffusing layer constituted by a thermoplastic material containing barium sulphate in an amount by weight, expressed as a percent ratio on the total weight of the diffusing layer of 0.01%-2.0%, when lit on one or more edges shows an improved light intensity and homogeneity on the panel. It is submitted that the cited references do not disclose the present invention.

It is observed that Kashima addressed the technical problem of providing a

backlighting device that possesses a high power efficiency to luminance conversion ratio and which is also capable of providing a high luminance. However, it is submitted that Kashima, whether taken alone or in view of '181, does not render the claimed invention obvious.

It is noted that the Examiner stated on page 3 of the Office Action that "Kashima discloses the light conducting plate made of polymethyl methacrylate PMMA having a thickness of 2 mm (column 7, lines 64-66) and which are used as the thermoplastic layer with a commercial polycarbonate sheet 360 μ m thick (column 10, line 33) where polycarbonate is known to be a thermoplastic material." It is also noted that Col. 10, lines 37-38, of Kashima discloses that the polycarbonate sheet comprised multiple parallel linear prisms.

In response to these points by the Examiner, the Applicant submits that the previous limitations and new amendments made to Claim 1 have rendered these bases for the rejection moot. It is noted that the present Claim 1 continues to recite that the thickness must be at least 3 mm. Therefore, the teachings of Kashima do not meet this requirement. Additionally, Kashima requires the use of a commercial polycarbonate sheet. Further, the polycarbonate sheet must possess multiple parallel linear prisms. As the present Claim 1 recites "consisting essentially of," these aspects of the Kashima invention would not be included in the presently claimed device. Therefore, it is submitted that these statements by the Examiner no longer apply to the present application and that this basis for maintaining the rejection is not well taken.

It is also noted that the Examiner stated on page 3 of the Office Action that the

"reference discloses enhancing means being entirely transparent and comprising at least one sheet (column 14, lines 8-9 and lines 34-44) with an area greater than 600 cm²." It is submitted that this comment is no longer relevant to the present invention. First, it is noted that the claims, as amended, no longer permit the addition of enhancing means to the present invention. It is also noted that all of the sheets used in Kashima possess an area that is less than 600 cm². Therefore, Kashima does not disclose or suggest backlighting devices that have surface lit homogeneity or areas greater than 600 cm². It is submitted, then, that this basis for the rejection is not well taken and it is requested that the rejection be withdrawn.

It is observed that the Examiner noted on page 3 of the Office Action that the "base sheet of Kashima is capable of containing particles of substances diffusing light." However, it is submitted that it is unclear to which base sheet the Examiner is referring. It is submitted that the [light conducting plate cannot contain such particles] because by definition the plate would then be a "light-diffusing plate" rather than a light-conducting plate. Additionally, it is submitted that sheet (7) cannot be the referred to sheet because sheet (7) is made of a light transmissive material that possess multiple parallel straight ridgelines or pyramidal or conical projections that are formed at minute intervals on the same side. However, neither the base sheet, the sheet (7), or any other sheet in Kashima is stated as being capable of containing particles of substances that can diffuse light. Therefore, it is submitted that regardless of which sheet the Examiner is referring to, this basis of the rejection is not well taken.

It is also noted that the Examiner stated on page 5 of the Office Action that "Kashima discloses a panel having light diffusing capability (column 2, lines 20-26) comprising barium sulfate (column 3, lines 9-10) which can be added to the layer with light diffusing areas (column 3, line 32)." It is submitted that the Examiner has misread the Kashima disclosure. Nowhere in Kashima is it disclosed that a panel comprises barium sulfate.] Rather, the disclosure teaches a light diffusing material is applied to part of the surface of the conducting plate. In other words, Kashima teaches a partial application of a light diffusing material to the conducting plate rather than an incorporation of the material into the body of the plate. Therefore, it is submitted that this basis for rejecting the claims is improper because the Kashima reference fails to disclose this aspect of the claimed invention and the '181 reference fails to correct this deficiency.

Additionally, it is noted that the light diffusing material is applied in part to the conducting plate. It is not applied totally to the plate. It is noted that lines 26-31 and Figure 9, curve e, make it clear that when total application is undertaken, an uneven luminance distribution results. Therefore, the teachings of the Kashima patent are actually teachings away from the present invention as Kashima teaches that 100% coverage results in uneven lighting results. The claimed invention requires incorporation (and, therefore, a 100% coverage). It is submitted, then, that the rejection is improper because Kashima actually teaches away from the present invention with its disclosure of 100% coverage resulting in uneven lighting. Additionally, the '181 reference fails to correct this deficiency. Therefore, it is submitted that the rejection is not well taken.

Additionally, it is submitted that the examples of Kashima clarify the meaning of the teachings of Column 3 of Kashima. The Examples make it clear that a paint that contains titanium white should be applied to the surface of the light conducting plate by screen printing a pattern of circular dots. Therefore, it is observed that Kashima does not disclose or suggest diffusing the diffusing material into the sheet. In fact, as stated above, the 100% coverage experiments teaches that such an action would most likely result in uneven light distribution. It is also noted that no thermoplastic sheet like that of the present invention is disclosed or suggested in Kashima because in the absence of screen-printed paints and inks, diffusion is obtained by roughening the surface of the light conducting plate. Therefore, it is submitted that the rejection is improper for these reasons as well.

It is also noted that the Examiner stated on page 5 that "Kashima states light diffusing film is placed on light conducting panel." However, it is observed that the cited lines in Kashima do not disclose this. Rather, Kashima states that a paint was applied over the surface of the plate in a screen printing in a pattern of circular dots. Therefore, it is submitted that a film was not coated on the Kashima plate. Rather, a series of dots were applied to the paint, thereby resulting in an incomplete coverage of the plate, contrary to the Examiner's assertions. Therefore, it is submitted that the Kashima reference has been misinterpreted in this fashion as well, as a screen printing of dots does not suggest or teach the layer claimed in the present Claim 1.

It is also noted that the Examiner stated on page 6 of the Office Action that the Applicant stated that one would not want to use a paint with titanium white because the Applicant has already compared titanium white and barium sulfate in the

examples. Applicant has reviewed the previous Response and does not believe that such a statement was made. It is submitted, though, that the circumstance in which a paint of barium sulfate is equivalent to a paint of titanium white does not hold true when one deals with these molecules dispersed in a thermoplastic sheet. As stated previously, the comparative examples show that these compounds do not behave in a similar manner. Therefore, it is submitted that this basis for sustaining the rejection is not well taken.

Finally, Applicant notes that the Examiner stated on page 6 of the Office Action that Applicant argued that Kashima could not provide intense and homogenous lighting. It is submitted that this is not the case. Applicant has advanced that Kashima does not disclose the present invention, not that the Kashima panels do not provide intense and homogenous light. Therefore, it is requested that this argument be withdrawn as well.

Therefore, it is submitted that the Examiner's reasons for maintaining the rejection in light of the Kashima reference are not proper for the reasons set forth above. Because the '181 reference (discussed below) does not address these deficiencies, it is submitted that the combination of the references cannot render the claimed invention obvious either.

EP '181 discloses a light reflective sheet which comprises a porous resin sheet and a protective layer laminated on at least one portion of the porous resin sheet, the resin sheet comprising a polymer resin and 100-300 parts by weight of a finely powdery inorganic filler with respect to 100 parts by weight of at least a polyolefin resin.

It is noted that the Examiner has responded to the Applicant's previous comments regarding the '181 reference by arguing that the light diffusing sheet does contain an inorganic filler (barium sulfate). However, it is noted that the light diffusing sheet does not contain the barium sulfate. Rather, it is the light reflecting sheet that possesses the barium sulfate. Therefore, it is submitted that the '181 reference has been misapplied by the Examiner against the present application. Because the light reflecting layer cannot diffuse light (absent significant and untaught modifications), it is submitted that the Examiner's comments regarding this reference are irrelevant to the pending prosecution (as they are all directed towards the light diffusing sheet rather than the light reflecting sheet which possesses the barium sulfate). It is requested that the rejection be withdrawn in light of this argument or that the Examiner further clarify his position.

The Examiner also argued on page 4 of the Office Action that one of ordinary skill would understand how to adjust the amounts and particle sizes of the barium sulfate based upon the amount of light he or she would want diffused. It is submitted that there is no support for this statement in the cited references and that the Examiner is impermissibly using hindsight to arrive at this conclusion. Therefore, it is requested that this basis for maintaining the rejection be withdrawn as well.

Finally, the Examiner argued on page 7 of the Office Action that Applicant advanced that the '181 reference does not contain any inorganic powder. It is submitted that the Examiner has misunderstood the argument presented in the previous Response. It is noted that it was argued that the '181 reference does not disclose a light diffusing sheet with barium sulfate. It is submitted that this is true (as

explained previously). Therefore, it is submitted that this basis for upholding the Response is not well taken either.

Therefore, in light of the above arguments and because Kashima does not disclose a diffusing thermoplastic sheet containing inorganic particles and because the '181 reference fails to correct this deficiency, it is submitted that the rejection is not well taken and it is requested that it be withdrawn.

In view of the amendments and remarks above, Applicants submit that this application is in condition for allowance and requests reconsideration and favorable action thereon.

In the event this paper is not considered to be timely filed, Applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referencing Attorney Docket No. 108907-09021.

Respectfully submitted,

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Enclosures: Marked Up Copy of Amended Claim
Petition for Extension of Time (1 Month)

MARKED UP COPY OF AMENDED CLAIM

1. (Thrice Amended) A thermoplastic composite panel[, comprising] consisting essentially of a base transparent thermoplastic layer, conducting the light, having a thickness in the range 3-40 mm and a diffusing light layer, having a thickness in the range 10-1500 micron, placed on one or both surfaces of the base layer, said diffusing layer constituted by thermoplastic material containing barium sulphate in amount by weight, expressed as per cent ratio on the total weight of the diffusing layer, in the range 0.01-2%, the barium sulphate having average particle sizes in the range 0.1-50 micron, the composite sides being at least \geq 10 cm, said composite having one or more edge lit, the composite area being greater than [100] 600 cm².